Space Weather Forecast

Issued on Friday, 02 September 2022 at 12:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight Chance of Moderate class flares. Minor Geomagnetic Storm expected day 3 (3 Sep).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low, with several Common class flares observed..Of the four active regions on the visible disc, AR3089 remains the largest and magnetically complex region and remains in a stable configuration. There are also two other numbered sunspot regions on the visible disc: AR3086 has recently faded near the southwest limb and AR3092 located near the southeast limb is a simple and inactive region. The last unnumbered region, also in the far southeast, is currently relatively small, magnetically simple and stable. No new Earth bound coronal mass ejections (CMEs) have recently been observed on available imagery.

Solar Wind / Geomagnetic Activity: Solar winds started at elevated level around 550 km/s due to an enhanced solar wind speed from a coronal hole feature. Solar winds declined erratically to reach mostly slightly elevated levels after 02/0200 UTC. The strength of the magnetic field was weak throughout. The important northwards/southwards magnetic component also remained at weak levels. Geomagnetic activity was Quiet to Unsettled.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is at background levels, with no solar radiation storms occurring

Four-Day Space Weather Forecast Summary

Solar Activity: Activity is Low. There is a slight chance (10-20%) of an isolated Moderate flare from the large region in the southwest. A new region may rotate onto the northeast limb within the next couple of days, potentially increasing the probabilities of a significant flare.

Solar Wind / Geomagnetic Activity: Solar winds are likely to decline further over the next few hours, before probably rising again early tomorrow or more likely early day 3 (4th) due to the connection with two consecutive fast solar wind streams. In addition a marked filament eruption observed on 30 August produced a Coronal Mass Ejection which may give a glancing blow at Earth, most likely impacting the Earth later tomorrow (3rd September), however confidence is low regarding this.
Geomagnetic activity is likely to be Quiet today, with perhaps an isolated Active interval. Geomagnetic activity is then expected to become Unsettled to Active tomorrow, then becoming during day 3 (4th) Active to Minor Storm, with an isolated Moderate storm interval possible, as a result of a substantial enhanced solar wind setting in.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to remain below the Minor Radiation Storm level (S1). There remains a slight chance of further increases to or above the S1 level, should any significant flares occur from the large region on the visible disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	30	80	60
Strong	G3	No	1	1	10	10
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	10	20	30
Very Active	R3 to R5 X	No	5	1	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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